





Tuesday, 25th March, 1913.

9 to 11 a.m.

University of Glasgow.

EXAMINATION FOR FIRST M.B.

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*BOTANY.*

1. Give a full account of the structure of a grain of wheat and of the storage materials laid up in it, and their distribution in the parts of the grain.
2. Give a brief sketch of the characters, morphological and physiological, of the bacteria.
3. What is chlorophyll, where does it occur, and what is its physiological significance ?
4. Give an account of the structure of phloem and explain its use.
5. Describe the gynaecium of some flower which you select, explaining the uses of its several parts.

*(Only FOUR questions to be attempted.)*



24th March, 1913.

} 1st Prof.—Two hours.  
} 1st B.Sc. and M.A.—Three hours.

## University of Glasgow.

### ZOOLOGY.

*Candidates are reminded to bring their dissecting instruments to the Oral Examination.*

*Candidates in MEDICINE are expected to attempt FOUR (not more) questions out of the NINE. Candidates in SCIENCE and in ARTS are expected to attempt FOUR questions in SECTION A and TWO in SECTION B.*

*Candidates should illustrate their answers by diagrammatic sketches wherever possible.*

#### A.

1. Write a short account of the physiology of *Amoeba*.
2. Describe the structure of an Ascon sponge such as *Leucosolenia*. Point out how it differs from a Sycon.
3. Write a comparative account of the alimentary canal in the Earthworm (*Lumbricus*) and the Leech (*Hirudo*), pointing out in what way it is specialized in the latter in connection with the mode of feeding.
4. Describe the life-histories of two parasitic Nematodes.
5. Draw a diagram to illustrate what is meant by the term "double circulation." Which groups among the lower Vertebrates possess such a circulation?
6. What are "visceral arches"? Describe the modifications which the skeleton of the first two undergoes in one of the lower Vertebrates such as *Scyllium*.

#### B.

7. "The Tectibranch Gastropods have been evolved from streptoneurous forms." Give the evidence upon which this statement is based.
8. What cytological phenomena have been observed to accompany the differentiation of soma from gonad in the developing embryo?
9. What is meant by the term Synaposematism or Müllerian Mimicry?



University of Glasgow.

FIRST PROFESSIONAL EXAMINATION FOR DEGREES  
IN MEDICINE.

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PHYSICS.

NOTE. — *Candidates are requested not to attempt more than FOUR of the following questions.*

1. Define moment of a force about a point, and illustrate by reference to the three kinds of lever.

Draw a sketch illustrating the action of a nut cracker. A nut cracker is 6 inches long. When a nut is placed at a distance one inch from the joint, a force of 3 pounds applied at the ends is required to break it. What weight placed on the top of the nut would crack it?

2. Define *density* and *specific gravity*. Explain how you would determine the specific gravity of (1) a solid insoluble in, and lighter than, water; (2) of a liquid.

The weight of a piece of cork in air is  $\frac{3}{4}$  oz., the weight of a piece of lead in water is  $6\frac{4}{9}$  oz., and the weight of the cork and lead together in water is 4.07 oz. Find the specific gravity of the cork.

3. Give an explanation of the fact that sound carries better with the wind than against it.

It is a well-known fact that sounds coming from a distance are heard with exceptional clearness at the close of a hot still summer day. Give an explanation of this phenomenon.

OVER.

4. Explain the method of mixtures in calorimetry, stating the precautions which have to be taken to ensure an accurate result.

A solid weighing 100 grammes is cooled by a freezing mixture to  $0^{\circ}$  F. and then dropped into a calorimeter of water-equivalent 5 grammes, containing 55 grammes of water at  $71^{\circ}$  F. The temperature of the calorimeter and contents falls to  $60^{\circ}$  F. Find the specific heat of the solid.

5. Give some account of the structure of the eye and of its action as an optical instrument. What are the "corresponding points" in the two eyes of an individual?

How is the impression of the solidity of objects obtained by binocular vision?

6. State Faraday's Laws of Electrolysis.

Four cells of 2 volts each are used to electrolyse acidulated water by means of a current of half an ampere. What is the apparent resistance of the electrolyte, the resistance of the battery and leads being 2 ohms?

How many milligrammes of hydrogen is liberated in an hour? Electro-chemical equivalent of hydrogen is 0.0104 milligrammes per coulomb.



University of Glasgow.

FIRST PROFESSIONAL EXAMINATION FOR M.B., CH.B.

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CHEMISTRY.

(Answer FOUR questions.)

1. Define the following terms and illustrate your definition by one example in each case: (a) molecule, (b) chemical equivalent, (c) dissociation, (d) normal solution of sulphuric acid, (e) an aldehyde.
2. Represent by means of equations the following reactions:  
Hydrochloric acid on (a) sodium thiosulphate, (b) manganese dioxide, (c) potassium dichromate; concentrated sulphuric acid on (a) potassium iodide, (b) mercury.
3. When concentrated sulphuric acid and oxalic acid are heated together, carbon monoxide and dioxide are evolved in equal proportions by volume. Give the equation for this reaction, and a *detailed* description of the method you would use to demonstrate this fact experimentally, illustrating the arrangement of the apparatus by means of sketches.
4. Describe, giving equations, the preparation and give the characteristic properties of the following substances: (a) potassium chlorate, (b) mercuric chloride, (c) urea.
5. State the methods of preparing methane, ethylene and acetylene, giving equations. Give the structural formulae of these and explain the action of chlorine on each of the three, and of concentrated sulphuric acid in ethylene.



25th March, 1913.

9 to 11 a.m

University of Glasgow.

SECOND PROFESSIONAL EXAMINATION.

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ANATOMY.

*(FOUR questions only to be answered, of these, questions 1, 2, and 3 must be attempted.)*

1. Describe the appearance of the lateral wall of the nasal fossa in the fresh state. Enumerate the air sinuses communicating with the nasal cavity, and state how you would demonstrate the relation of each sinus to the nasal cavity.
2. Give the origin, course and insertion of the Ilio-psoas muscle, and describe its vascular and nerve relations.
3. Describe the biliary passages, and give a sketch of their development.
4. Explain the mode of formation of the posterior cord of the brachial plexus, and describe the course and distribution of the branches of this cord as far down as the elbow.
5. Describe a transverse section of the thigh just above the trochlear surface for the patella.



University of Glasgow.

DEGREES OF M.B. AND CH.B.

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PHYSIOLOGY.

*(The first two questions are to answered in one Examination Book,  
the last two in the other.)*

1. What is the nature of the “ peripheral resistance ” in the circulation ? What effect does increase of it exert upon the general features of the circulation ?
2. Describe the minute structure of a lobule of the lung, and the gaseous exchanges which take place therein.
3. How have the movements of the large intestine in man been studied ? Describe (a) these movements, (b) the process of defæcation.
4. *Either* (a) What are the characteristics of an enzyme ? Illustrate your answer by reference to simple laboratory experiments. What is the rôle of enzymes in metabolism ?

*Or*

(b) Enumerate the species of sensations elicitable from the surfaces within the mouth. Describe the field of distribution of each of these. Describe any particular nervous end-organ in the mouth which you consider has been identified with some one species of sensation.



Monday, 24th March, 1913.

9 to 11 a.m.

University of Glasgow.

PROFESSIONAL EXAMINATION.

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*MATERIA MEDICA AND THERAPEUTICS.*

PROFESSORS CUSHNY AND STOCKMAN.

1. State what you know of the physical characters, dose, method of administration, and therapeutical uses of *sodium salicylate*. What poisonous symptoms may arise from it ?
2. Name four drugs which are used to induce sleep. What are the special indications, advantages, and drawbacks of each ?
3. Discuss the action of *alcohol*, *ether*, and *chloroform* on the circulatory system.
4. State the therapeutical uses and doses of *grey powder*, *copaiba*, *codeine*, *chrysarobin*, *amyl nitrite*, and *lime water*.
5. Explain as far as you can the diuretic action of *caffeine*, *potassium acetate*, *oil of juniper*, and *squill*.





25th March, 1913.

12 noon to 2 p.m.

University of Glasgow.

THIRD PROFESSIONAL EXAMINATION.

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*PATHOLOGY.*

1. Discuss the factors concerned in the production of thrombosis. Describe the process as occurring in an artery and the changes which may follow in the thrombus and vessel-wall.
2. Give an account of the *Bacillus diphtheriæ*, its mode of action, and distribution in the body; describe also the local lesion in the pharynx.
3. What are the causes and varieties of acute suppuration in the kidney? Describe the naked-eye and microscopical changes produced in the organ.
4. Describe the lesions which may be produced by tuberculosis in the central nervous system.
5. Give an account of the changes which may be found at the post-mortem examination in a case of subacute nephritis where death has occurred from uræmia.

(Not more than FOUR questions to be answered.)



University of Glasgow.

EXAMINATION FOR DEGREES IN MEDICINE  
AND SURGERY.

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*MEDICAL JURISPRUDENCE.*

(N.B.—FOUR questions only to be answered, of which No. 5 must be one).

1. Give in detail the procedure in (a) England, and (b) Scotland for the post-mortem examination of a human body for medico-legal purposes with reference to (1) the legal authorities, and (2) the medical examiners.
2. How may it be determined (1) that certain lesions on a dead body had been produced by burning (a) by fire, or (b) by a scalding fluid, or (c) by a corrosive fluid; (2) that the lesions had been produced (a) before, or (b) after death; and (3) that the lesions were the cause of death?
3. Define “infanticide.” What are the evidences of (a) viability, and (b) maturity of a newly-born child? What signs would indicate that the child (a) had breathed, and (b) had been born alive?
4. Discuss fully the legal definition of a wound. Grade wounds according to their relative gravity. Classify them and describe the characters of each class. How may they cause death?
5. What are the fatal dose, the signs and symptoms, the treatment and the post-mortem appearances in poisoning by carbolic acid? How may the poison be separated from the contents of the stomach? By what chemical tests may the presence of the poison be proved?



University of Glasgow.

EXAMINATION FOR DEGREES IN MEDICINE  
AND SURGERY.

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*PUBLIC HEALTH.*

(N.B.—FOUR questions only to be answered.)

1. Name and describe some of the inlet ventilators which may be used for living rooms as applied to (a) the window, and (b) the walls. How do they act? How is the fouled air extracted in such rooms?
2. Name the constituents in waters which are likely to produce harmful effects on the users. How do they severally act? How may they be prevented, or, if present, be removed? What diseases may be water-borne?
3. Discuss briefly how bacteria operate in (a) sand filtration for the purification of water for potable purposes, and in (b) the purification of sewage. Describe shortly a scheme for each of these purposes.
4. State the function and describe the requirements of (a) the soil-pipe, (b) the disconnecting ventilating trap, and (c) the house drain in a system of house drainage.
5. Explain the following terms and phrases: zymotic; infection; aerial convection of small-pox; enteric carriers; and incubation. What are the incubation periods of diphtheria, scarlet fever, enteric fever, and measles?



Friday, 21st March, 1913.

2 to 4 p.m.

University of Glasgow.

DEGREES OF M.B. AND CH.B.  
FINAL PROFESSIONAL EXAMINATION.

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*SURGERY.*

(FOUR questions to be answered.)

1. Give the pathology, symptoms and treatment of scoliosis.
2. Compare the symptoms and signs in retention from (a) stricture of the urethra, (b) enlarged prostate.
3. Describe the symptoms present in the earliest stage of tuberculous disease of the hip joint in a child. Give a full description of the method in which you would conduct the examination of such a case, and describe the pathological changes you would expect to find.
4. How may fracture of the middle fossa of the skull be produced, what signs are present, and what are the results which may follow?
5. Along what paths may infection spread from the middle ear?





University of Glasgow.

DEGREES OF M.B., CH.B.  
FINAL PROFESSIONAL EXAMINATION.

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*PRACTICE OF MEDICINE.*

1. What are your views as to the genesis of vesicular emphysema? With what conditions is it associated and what alterations does it induce in the conformation of the thorax and in the solid organs in the vicinity of the lungs?
2. Discuss the etiology, diagnosis and treatment of acute pericarditis with effusion.
3. Describe the symptoms and signs which may be met with in a case of gall-stones, and discuss the etiology and treatment of cholecystitis.
4. Discuss the etiology and symptomatology, including physical signs, of aortic incompetency. What instructions would you give a patient suffering from it as to the tenor of his life and what medicinal measures would you adopt?
5. A man aged 40, hitherto without complaint, has for some time had left-sided headache generally of moderate severity but occasionally more acute. Recently he has had transitory twitching of the fingers of the right hand and been conscious of slight, but passing, embarrassment of speech. Suddenly he is seized with general convulsions accompanied by unconsciousness lasting 20 minutes and on recovery remains more or less dazed for some hours but without obvious paralysis.

To what would you ascribe such symptoms? What other facts in the case would help you to your diagnosis, and what other means of investigation would you employ to substantiate it?

Detail the treatment you would adopt.

(Four questions to be answered, of which No. 5 must be one.)



22nd March, 1913.

*Time—Two hours.*

University of Glasgow.

DEGREES OF M.B. AND CH.B.  
FINAL PROFESSIONAL EXAMINATION.

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*OBSTETRICS AND GYNAECOLOGY.*

1. Describe the various methods of artificial dilatation of the cervical canal to facilitate delivery.
2. Describe the mechanism of labour in a third vertex presentation (R.O.P.), and state how you would deal with such a case.
3. A woman with a conjugata vera of  $3\frac{1}{4}$ " informs you that she lost her first child after a difficult forceps delivery. How would you treat such a patient in the event of her again becoming pregnant?
4. Describe briefly the changes which occur in the uterus as a result of septic infection during parturition.
5. Enumerate the conditions which cause distension of one or both Fallopian tubes. Select one of the conditions, and give its treatment.



1st October, 1912.

9 to 11 a.m.

University of Glasgow.

LORIMER BURSARY.

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ANATOMY.

1. Describe the structural elements in fibrous connective tissue, name the different forms which this tissue may assume in the body, and note the physical characters of each.
2. Describe a typical vertebra, and give an account of its development.
3. Describe the elbow joint under the following heads: (*a*) bony surfaces which play with one another; (*b*) ligaments which bind the bones together; (*c*) movements which take place at the joint; (*d*) the principal muscles effecting these movements.
4. Describe the origin, course and distribution of the ulnar nerve.





